



Subsurface Underground Engineering Process Final Exam

1. All of the following are subsurface utility engineering responsibilities except:
 - a. Utility mapping and coordination at appropriate quality levels.
 - b. Utility relocation, design, coordination, assessment and cost estimates.
 - c. Communication of utility data and implementation of policies.
 - d. Utility governance and resource delivery.

2. During the 90's, FHWA heavily promoted the use of SUE and the associated:
 - a. Utility best practices.
 - b. Methods of excavation.
 - c. Quality levels of utility data.
 - d. SUE professional development.

3. The experts and specialized professionals that come together for a cross-sectional approach would include all the following except:
 - a. Surveyors, drafters, geotechnical engineers.
 - b. Utility owners and resource planners.
 - c. Civil engineers and right-of-way managers.
 - d. Geophysicists, geodesists, geologists and GIS professionals.

4. The Four Quality Levels A-D were established in the 90s to signify all the following methods expect:
 - a. QL-A: Records, surveys, geophysical techniques and excavation (precise H & V position and type, size, material and condition).
 - b. QL-B: Records and added surveyed utility features and surface geophysical techniques to determine existence of horizontal position of utilities.
 - c. QL-C: Records and added surveyed utility features.
 - d. QL-D: Records, minimally intrusive excavation, interviewing, estimation.

5. Core concepts of SUE are:
 - a. Conflict Analysis, Data Management, designating, locating.
 - b. Conflict Analysis, Data Distribution, exacting, measuring.
 - c. Site Analysis, Data Analysis, designating, locating.
 - d. Site Analysis, Data Analysis, exacting, measuring, defining.

6. What is a One-Call notification center?
 - a. The project stakeholders and everyone that will be impacted.
 - b. An entity that administers a system through which a person can notify utility owners and operators of proposed excavations.

- c. The center that holds all utility records that you must visit at the city center of town.
 - d. A records management system that exists on the cloud and is only accessed by licensed professionals.
7. Examples of the risks SUE manages and prevents are all the following except?
- a. Damage to utilities and project delays.
 - b. Safety of workers and public.
 - c. Change orders and redesign costs.
 - d. Professional resignation and lack of project support.
8. In SUE, the engineer is supposed to:
- a. Advise the project owner and review data.
 - b. Run the project on their own and perform all duties.
 - c. Approve every component of the project.
 - d. Deliver final output in CAD format.
9. Traditional methods of SUE include:
- a. Existing records, research, GPR, Excavation. Surveys of roadways nearby.
 - b. Talking to residents, minimal excavation, geomatic research, surveying the entire section of the site.
 - c. Records research and field survey of surface features: Valves, hand boxes, meters, manholes, hydrants; 811 marks.
 - d. Specialized measurement equipment that has advanced further in today's age.
10. SUE deliverables will be in accordance with ASCE code 38-02: The depiction of Subsurface Utilities. The code is very important and must be adhered to because:
- a. It specifies how underground utilities must be depicted on professional engineering drawings (along with associated quality levels).
 - b. It specifies how underground utilities will be measured and what professionals can oversee this.
 - c. It specifies what governmental agencies are involved in SUE and how they approve projects.
 - d. It specifies how engineers will communicate with surveyors to produce the work required for SUE and all its components.
11. By accurately determining the location of underground assets as early as possible; SUE significantly reduces the various types and layers of:
- a. Management disputes.
 - b. Construction problems.
 - c. Public Safety concerns.
 - d. Measurement specifications.

12. Technologies for investigation of underground utilities can be classified into all the categories except:
- Methods Based on Electromagnetic (EM) Waves.
 - Mechanical Waves-Based Methods.
 - Other Methods like resistivity methods, magnetic methods, micro gravitational methods, and chemical methods.
 - Non-localized alternative radar methods.
13. ASCE and the Construction Institute (CI) sought to provide a national standard for SUE in order to reduce _____ and create _____:
- The cost of construction; accurate total project cost projections.
 - Potential liability; standardized guidelines for operating when dealing with underground utilities.
 - Risks; communication systems for project and resource owners.
 - Costs; a sequential system for service delivery.
14. In addition, the ASCE 38-02 document references other official documents and formal procedures such as:
- ASCE 12, 13, and 14; ASCE MOP 45; AASHTO GAU.
 - ASCE 15, 19, 23; ASCE DOT 40; ASHO GP.
 - ASCE 21, 27, 29; ASCE 95-46; ASHTO GA
 - ASCE 5, 7; ASCE VER 99; AASHTO GDP.
15. Every project will have an Acceptable Risk and expertise is necessary to determine this. Professionals must know the acceptable risk before starting their project. What is Acceptable Risk?
- The minimum amount of effort or work-force output put forth to keep everyone safe.
 - The minimum amount of risk that can be reasonably given away (mitigated) or legally insured.
 - The minimum amount of risk that a SUE practitioner can have in their project.
 - The minimum amount of risk that can be reasonably and safely planned for and understood to ensure manageable project execution.
16. The primary value of SUE is in its ability to:
- Prevent service interruptions, minimize budget contingencies and enhanced construction safety.
 - Prevent unfair business practices, maintain open market share and improve competition in the market.
 - Guarantee service delivery, reduce costs and simplify the construction process.
 - Outline the work managers want carried out, prevent confusion and maximize the profit of projects.

17. If subsurface utilities are left unfound and are unaddressed until time of construction, the cost-conflict resolution _____ and the potential of _____ will be _____.
- Increase in complexity; damages; higher.
 - Be eliminated; success; increased.
 - Stay the same; stability; enhanced.
 - Increase in complexity; success; deferred.
18. How many U.S. states have officially implemented any form SUE program in their requirements for highway construction project to-date?
- Nine.
 - Twenty-Seven.
 - Thirteen.
 - Twenty.
19. In Colorado, the system is managed by the operators and owners of the utilities it provides service requests for; also known as:
- The club.
 - The group.
 - 'the association'.
 - The owners.
20. A SUE survey is required at the expense and by duty of the:
- The excavator.
 - The Surveyor.
 - The Owner.
 - Project Sponsor.